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April 24, 1996

VIA FEDERAL EXPRESS

Edward Hanlon
On-Scene Coordinator
United States Environmental Protection Agency
Region V, SR-6J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Re: ***Dutch Boy Site***

Dear Mr. Hanlon:

I am writing on behalf of NL Industries, Inc. ("NL") with respect to the CERCLA Section 106 Order (the "Order") issued to NL regarding the former ***Dutch Boy Site*** in Chicago. Pursuant to Section V(1) of that Order, NL is hereby notifying U.S. EPA of its intent to comply with the terms of the Order.

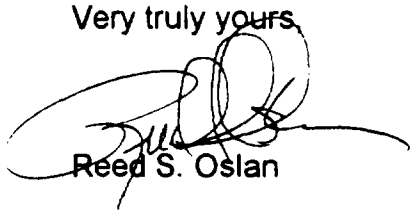
Consistent with our earlier discussions and correspondence clarifying U.S. EPA's position with respect to the work to be performed, NL is proceeding to meet the deadlines set forth in the Order.

NL designates Ranjit Machado of Environ Corporation as its Project Coordinator. Mr. Machado is a Manager with Environ in its Arlington, Virginia Office, 4350 N. Fairfax Drive, Arlington, VA 22203, telephone number (703) 516-2300. Information regarding Mr. Machado's qualifications is enclosed. We also will be

forwarding to you additional information regarding Environ generally and Environ's experience in handling these types of matters under separate cover.

Please call me with any questions or comments.

Very truly yours,



Reed S. Oslan

Enclosures

cc: Christine M. Liszewski, Esq. (via Federal Express)
Marcus A. Martin, Esq.
Ranjit Machado

RANJIT J. MACHADO, P.E.

EDUCATION

1985 M.E., Environmental Systems Engineering, Clemson University

1983 B.S., Chemical Engineering, Indian Institute of Technology

REGISTRATION

Certified Professional Engineer

EXPERIENCE

Mr. Machado is a Manager at ENVIRON Corporation. His experience at ENVIRON includes the following:

- Provided technical support for litigation involving environmental exposure to contaminants. Responsibilities included providing expert testimony, identifying expert witnesses, preparing technical witnesses for deposition, evaluating the strengths and weaknesses of the technical case, modeling contaminant transport, and providing recommendations on field sampling and analytical laboratories.

- Reviewed air permit applications and supporting engineering calculations for a proposed mining facility. Provided expert testimony on environmental releases and resulting exposures.

- Reviewed air dispersion analysis in support of applications to construct combustion turbines, to generate power, and a cogeneration facility, to generate power and steam, and provided expert testimony.

- Provided expert testimony before the Regional Water Quality Control Board (California) regarding alleged releases of heavy metals to surface water in violation of an NPDES permit.

- Provided expert testimony on ground water remediation and risk assessment issues at a former coal gasification site.

- Developed expert reports on exposure to lead from industrial operations and for purposes of allocation in a mediation hearing. Participated in all phases (RI, FS, post-ROD) of evaluation at several Superfund sites involving lead as a primary contaminant (releases from primary and secondary lead smelting operations; production of lead-based products).

- Project leader for the risk assessment conducted for the WTI commercial hazardous waste incinerator. This multipathway risk assessment considered human health and ecological risks associated with routine incinerator emissions and the adverse effects of accident and upset

conditions. Conducted risk assessments for incinerators in California, Missouri, Virginia, and Kentucky.

- Designed and implemented sampling plans for soil-gas at sites involving petroleum hydrocarbons and chlorinated organics; ambient air sampling of organics using Tenax tubes and stainless steel canisters; and soil and water sampling for organics and heavy metals.

- Conducted environmental audits at numerous industrial, manufacturing, and fabrication facilities as part of due diligence reviews in order to assess the potential for significant environmental liabilities.

- Conducted comprehensive environmental assessments at steel manufacturing facilities; from large, integrated mills with coke oven batteries to the smaller mini-mills using scrap materials. Potentially significant liabilities at these facilities included reclamation associated with mining dolomite and iron ore, RCRA corrective action of SWMUs, Superfund and RCRA liability associated with on-site and off-site disposal of KO61 waste, and costs associated with Clean Air Act compliance.

- Assisted a steel association in obtaining the necessary data for filing delisting petitions under the Clean Air Act, which included meetings with EPA.

- Performed an air dispersion analysis for air-toxic emissions from a specialty steels facility involving 30-35 sources. Assignment was conducted in response to Maryland Air Toxics regulations and involved conducting an emissions inventory, evaluating control technologies, and negotiations with State authorities.

- Analyzed emissions from primary and secondary lead smelters and assisted in drafting and implementing a good-faith offer for lead clean-up of residential and industrial areas. Also participated in projects involving lead-containing battery casings, industrial uses of lead, lead in paint, and an overall analysis on the use of lead. The IU/BK model was applied to predict blood lead levels for several of these projects.

- Evaluated emissions associated with the milling, roasting, smelting, and refining of lead and arsenic ores. Predicted off-site metal concentrations and air deposition. Provided technical expertise in evaluating migration and exposures to mine tailings containing heavy metals such as lead, arsenic, and cadmium at Superfund sites. Assisted in the development of sediment and wetlands cleanup criteria for heavy metals at Superfund sites.

- Evaluated the cost and effectiveness of carbon adsorption and air-stripping for treatment of ground water containing chlorinated volatile and semi-volatile organics.

- For several California Proposition 65 clients, modeled and assessed indoor exposures to chemicals released by several mechanisms including the use of household products, emanations from ovens and vinyl sheet emissions, and outdoor exposure including downwash analyses.

- Conducted exposure assessments and developed generalized models for different exposure routes (air, ground water). Reviewed and critiqued exposure and endangerment assessments at several Superfund sites. Assessed the contribution of PRPs at several Superfund sites with respect to contamination, endangerment, liability, and allocation.

- Assessed the impact of multiple atmospheric releases to residents in the southeastern Chicago area.

Prior to joining ENVIRON, Mr. Machado performed theoretical and experimental research in biological wastewater treatment. This research included the development of biokinetic models to predict the fate of a xenobiotic pollutant in an aqueous environment. The experimental apparatus consisted of a series of batch reactors operating at different residence times to observe the effect of residence time on dual substrate utilization by an axenic bacterial culture.

PROFESSIONAL MEMBERSHIPS

Member, Chi Epsilon National Civil and Environmental Engineering Honor Society.

Member, Air and Waste Management Association.

Member, American Chemical Society.

PUBLICATIONS AND PRESENTATIONS

Schlesinger, J.S., et al. 1987. Application of an air model in a risk assessment. Presented at the ASCE 1987 National Conference on Environmental Engineering, July.

Scofield, R., et al. 1988. Multipathway risk assessment methodology compatible with California Decision Tree and EPA Superfund guidelines. Accepted for presentation at HWHM '88 conference in Las Vegas. April 1988.

Brett, S., et al. 1989. Hazardous waste site risk assessment: Applications and limitation of current methodologies. In Environmental Risk Assessment: A textbook of case studies, edited by Dr. Dennis Paustenbach. John Wiley & Sons, Inc., Publishers.

Brett, S., and R. Machado. 1989. Health risks of remediating a hazardous waste site. Presented at a short course at the Society of Toxicology Annual Meeting. Atlanta, GA. February 1989.

Machado, R.J. and C.P.L Grady, Jr. 1989. Dual substrate removal by an axenic bacterial culture. Biotechnology and Bioengineering. January.

Turnbull, D., R.J. Machado, and R.E. Boberg. 1994. Safety Assessment of HCFC-141b: Use as a blowing agent for insulation in building construction and refrigeration. Regulatory Toxicology and Pharmacology. vol. 19, pp. 282-296.

ENVIRON

Firm Overview

A leading technical, scientific, and regulatory affairs consulting firm, ENVIRON assists clients addressing the multifaceted issues associated with the presence of hazardous substances in the environment, in consumer products, and in the workplace. The firm's success is attributable to the growing demand for expert counsel in chemical risk assessment and risk management, product stewardship, and environmental risk management services.

Our professionals provide expert technical assistance and strategic support in the following areas:

- Site Investigation/Remediation:
  - Superfund
  - RCRA
  - State and local requirements
  - Remediation assessment
  - Municipal Solid Waste
- Compliance Assistance:
  - Medical device registration
  - Pesticide registration
  - Permitting discharges and emissions
  - Ground water monitoring
  - SARA Title III
  - Occupational Health & Safety
- Risk Assessment:
  - Human health effects
  - Ecological effects
  - Establishing cleanup levels
  - California's Proposition 65
  - Permitting
  - Food, food additives, flavors, medical devices, pharmaceuticals, pesticide residues, packaging
  - Biotechnologically derived food crops and products
- Litigation Support/Expert Testimony:
  - Toxic tort
  - Criminal environmental defense
  - Mediation
  - Internal investigation
  - Insurance claims
  - Superfund cost allocation
- Environmental Liability & Compliance Assessment:
  - Due diligence reviews
  - Property transactions
  - Insurance risk assessments
  - Compliance audits
- Exposure Assessment:
  - Ground water/surface water
  - Food contaminants
  - Air dispersion
  - Indirect exposure pathways
  - Industrial Hygiene
- Food Safety
  - Product/ingredient safety reviews and regulatory submissions
  - Health claims
  - Nutrition labeling
- Air Quality
  - Emissions and dispersion modeling
  - Exposure assessment analysis
  - Air pollution compliance assistance
  - Ambient & indoor monitoring
  - Emergency release modeling
  - Emissions inventories
  - Analysis of alternative control strategies
  - Leak detection and repair
  - Transportation/air quality conformity analysis
- Water Quality Management
  - Water quality and treatment
  - Water reuse evaluation
  - Water quality modeling
  - Value engineering

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The firm's exceptional professional staff includes experienced toxicologists and ecotoxicologists, epidemiologists, biostatisticians, chemists, environmental scientists, ecologists, civil, chemical, and environmental engineers, geologists and hydrogeologists, and regulatory and public policy specialists. ENVIRON's principals and other senior staff members have held high-level scientific and regulatory policy positions in both government and the private sector. They have published extensively in their fields and are widely respected for their professional experience and leadership and for their ability to communicate effectively to different audiences about environmental risks and liabilities.

Many of the issues confronting ENVIRON's clients are at the forefront of technological development, involve substantial scientific uncertainties, or are the subject of costly and extensive litigation. In today's burgeoning market for risk assessment and risk management services, ENVIRON is unique in its ability to provide the multidisciplinary services required to tackle a broad range of consumer and environmental risk problems and to develop cost-effective solutions, always mindful of the economic and legal pressures on the decision maker.

June 1995

For more information about ENVIRON and our services, contact the office nearest you:

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Arlington, Virginia 22203
(703) 516-2300

Marketplace Tower
5820 Shellmound Street, Suite 700
Emeryville, California 94608
(510) 655-7400

One Park Plaza, Suite 700
Irvine, California 92714
(714) 261-5151

214 Carnegie Center
Princeton, New Jersey 08540
(609 452-9000

Golden Gate Plaza
101 Rowland Way
Novato, California 94945
(415) 899-0700

1980 Post Oak Boulevard, Suite 2120
Houston, Texas 77056
(713) 622-5888

ENVIRON

Superfund

ENVIRON has assisted private and public sector clients with analysis, negotiation, and resolution of the complex technical, regulatory, and legal issues addressed by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA). Our work has involved all aspects of site evaluation, remediation, and settlement negotiation, including the following:

- conducting Remedial Investigations/ Feasibility Studies (RI/FS) at National Priorities List (NPL) sites;
- preparing environmental and public health risk assessments;
- reviewing and critiquing USEPA Records of Decision (RODs);
- developing cost apportionment schemes as part of settlement negotiations among Potentially Responsible Parties (PRPs);
- conducting engineering studies of innovative site remediation technologies;
- providing citizens' groups with technical assistance through EPA's Technical Assistance Grant (TAG) program;
- offering scientific staff support to the EPA Office of Policy Development and Office of Solid Waste, and to the Congressional Office of Technology Assessment; and
- providing litigation support and expert testimony in engineering, environmental sciences, toxicology, and public health risk assessment; and interpreting the requirements of the National Contingency Plan.

Our approach to the evaluation of Superfund sites and to the selection of remedial alternatives differs from many traditional engineering consultants in that our firm's work has been founded on, and is often guided by, a strong scientific basis in health and environmental risk assessment.

ENVIRON has pioneered the use of risk assessment in evaluating remedial options at many NPL sites. In this work, ENVIRON has taken the position that the evaluation of competing remedial alternatives should be based on a defensible scientific analysis of the public health and environmental protection benefits offered by each remedial alternative during and following its implementation. Engineering feasibility, public policy considerations, and costs must also be considered. Such an approach often demonstrates the benefits of innovative remedial solutions from a quantitative health risk perspective.

USEPA recognized ENVIRON's expertise in applying health risk analyses to the Superfund and hazardous waste arena when it retained ENVIRON to prepare agency guidance documents for conducting public health analyses.

Following are selected ENVIRON projects related to Superfund.

- ENVIRON has conducted public health assessments at numerous NPL sites throughout the country where the chemicals of predominant concern were, among others, dioxins, polynuclear aromatic hydrocarbons (PAHs), PCBs, and lead and other heavy metals. These analyses have led to the recommendation of site-specific

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Superfund (continued)

cleanup levels.

- ENVIRON is conducting the remedial design at a Superfund site in Pennsylvania. The design for the $125 million remedy will include treatability studies and risk assessments for potentially high arsenic-containing organic wastes, which the ROD requires to be incinerated.

- As consultant to one of several PRPs at a complex NPL site in the western U.S., ENVIRON has provided technical support and oversight to all phases of RI/FS planning and execution and has participated in negotiations with state and federal agencies. We led the PRP group effort to develop equitable schemes for cost apportionment, including an evaluation of the basis of *de minimis* settlements. In addition, we compiled a waste-in data base to determine each PRP's volumetric contribution to the site and to evaluate the toxicity of the waste streams.

- ENVIRON provided scientific support to a community technical advisory committee at an NPL site in California. We reviewed the technical merits of proposals for remediating the site and assisted the surrounding community in understanding the complex engineering and scientific data generated during implementation of the cleanup and, in particular, while conducting the RI/FS.

- ENVIRON has supported counsel for both plaintiffs and defendants in complex litigation of Superfund and CERCLA private-party cases involving third-party toxic torts, cost recovery actions, *de minimis* settlement of liability negotiations, and cost apportionment.

- ENVIRON has provided litigation support to PRP groups challenging EPA RODs at a number of Superfund sites throughout the country.

- ENVIRON has prepared complex ground water modeling studies to design and evaluate hydraulic controls to recover or limit the spread of chemicals from shallow aquifers at a New Jersey NPL site.

- ENVIRON prepared reports for the Office of Technology Assessment (OTA) of the U.S. Congress on approaches to determining "how clean is clean" at Superfund sites, and on whether Superfund sites pose significant health risks.

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ENVIRON

Site Investigation

ENVIRON has conducted several hundred site investigations for industrial clients, insurance companies, and major law firms under state and federal statutes (e.g. Superfund, RCRA, TSCA, New Jersey's ISRA [formerly ECRA]), and California's Toxic Substance Control and Porter-Cologne programs.)

Our site investigation services include all aspects of remedial investigations, feasibility studies, and endangerment assessments.

Our field services in support of site investigation programs include a broad spectrum of scientific disciplines and techniques. We maintain an active health and safety training program and medical surveillance of our professional staff in compliance with EPA guidelines and OSHA standards for hazardous waste workers.

Following are selected examples of the variety of site investigations and remedial action plans that have been undertaken by ENVIRON.

- ENVIRON has conducted numerous investigations at state and federal Superfund sites; project work has included the preparation of planning documents and remedial investigation/feasibility study reports, and subsequent implementation of those plans; public health and environmental risk assessments; and transport modeling related to the movement and recovery of chemicals in ground water systems.

- ENVIRON has performed over 100 site investigations in compliance with New Jersey's ISRA (formerly ECRA) statute. These investigations typically involve drafting a detailed investigative plan that includes sampling protocols and quality assurance plans; performing site inspections and inventories of areas of environmental concern; executing field activities (e.g., soil borings, monitoring well construction, sampling and chemical analysis); conducting a data quality control review; constructing a data base; developing remedial plans; and negotiating cleanup standards with regulatory agencies.

- ENVIRON performed a complete remedial investigation, feasibility study, and risk assessment in accordance with California and CERCLA guidelines for a solvent-related project in Silicone Valley, California. Project work included all phases of field studies, quantitative analyses, and reporting.

- ENVIRON conducted a detailed site investigation at an industrial metals-working facility in Massachusetts to determine the extent of on-site contamination by VOCs, heavy metals, and radionuclides, and their impact on soils, ground water, drinking water supplies, and adjoining surface water/wetland areas. Project work included monitoring well construction and aquifer testing, soil gas testing, indoor air quality analysis/remediation, development of a comprehensive site-wide remediation plan, and negotiations with USEPA, the Commonwealth of Massachusetts, and the town Board of Health.

- ENVIRON has prepared detailed on-site hydrogeologic and soils investigations for a large waste recycling and treatment firm, in support of RCRA Part B permits for the firm's treatment, storage, and disposal facilities in South Carolina and California. ENVIRON constructed monitoring wells and soil borings; planned and executed aquifer pumping tests; performed ground water modeling and soil gas investigations; designed and constructed ground water

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Site Investigation (continued)

monitoring systems; and gave expert testimony before state and federal regulatory agencies.

- ENVIRON developed Alternate Concentration Limits (ACLs) for ground water at several industrial facilities in support of RCRA Part B Permitting requirements.

- ENVIRON conducted a detailed investigation at a manufacturing facility in Nebraska to determine the extent of release of VOCs into ground water, and the potential impact on nearby public and private water supplies. Project work included performing ground water quality modeling and health risk analysis.

- ENVIRON assessed the potential environmental and health risks of pesticide residues in soils on former farmland developed for commercial and residential use. ENVIRON's work included assessing the public risks, developing sampling strategies, determining the need for remedial action, and preparing reports to lending institutions, developers, and regulatory agencies.

- For several semiconductor manufacturing facilities in the San Francisco Bay area, ENVIRON has prepared remedial investigations, feasibility studies, endangerment (risk) assessments, and remedial designs.

- At a waste oil refinery in Louisiana, ENVIRON conducted a RCRA Facility Investigation to define the extent of soil and ground water contamination from the prior disposal of still-bottoms and waste residues in unlined pits. This project led to the development of a soil and ground water remediation plan, removal of disposed wastes from pit areas, and construction of a ground water recovery/treatment system. ENVIRON provided full design and construction management services.

- At a petroleum refinery in New Jersey, ENVIRON conducted soil and ground water investigations to evaluate impacts from prior and ongoing operations. This project involved the development of a strategic investigative program, negotiation with regulatory agencies, construction of several hundred monitoring wells, aquifer testing, and ground water and soil sampling/analysis and reporting.

- ENVIRON has conducted over 75 site assessments and remediation programs for underground storage tanks containing gasoline, diesel fuel, and synthetic organic chemicals. These assessments have included tank integrity testing, tank and soil removal, ground water remediation, *in situ* closure, and reporting.

- At a metal plating facility, ENVIRON conducted a soil and ground water quality investigation that included an assessment of the impact of two RCRA-permitted and closed lagoons, several underground storage tanks, several floor drains, and past on-site disposal of spent solvents. We developed a ground water cleanup plan that encompassed recovery of contaminated ground water off-site, and treatment using air stripping and activated carbon technology.

ENVIRON

Remedial Design and Engineering

ENVIRON's team of environmental, civil, and chemical engineers, geologists and hydrogeologists, and environmental and health scientists provides a full range of services from site characterization and remedial investigation to remedial design and remedy implementation.

Remedial design and engineering as practiced at ENVIRON includes not only preparing drawings and design specifications, but also conducting pre-design treatability studies of the efficacy of remedial technologies, preparing preliminary engineering reports and final bidding documents, and evaluating and selecting contractors, whose work we coordinate and oversee for our clients. The objective of reducing health and environmental risk, combined with a strong background in technology, drives ENVIRON's designs and solutions.

We have provided these multi-disciplinary services to clients whose sites were subject to major federal statutes, such as Superfund, RCRA and TSCA, and leading state initiatives, such as the New Jersey ISRA (formerly ECRA) and California SWAT programs. Following is a representative sampling of ENVIRON's work in this area.

- ENVIRON managed a multiphase ISRA/ECRA investigation and cleanup at a large precious metals refinery in an industrial area of Newark, New Jersey. The 42-acre facility, constructed on a former municipal landfill, contained more than 75 areas of environmental concern. Analytical results indicated the site-wide presence of priority pollutant metals (PPMs), and local occurrences of total petroleum hydrocarbons (TPHCs) and volatile organic compounds (VOCs).

  ENVIRON's risk assessment specifically considered on-site and off-site worker exposure, as well as exposures to nearby residents, and was instrumental in the development of site-specific soil cleanup guidelines. These guidelines were used in developing a site Cleanup Plan, which proposed several alternatives for soil remediation, including an innovative soil sorting/soil washing technology.

- ENVIRON conducted a Remedial Investigation/Feasibility Study (RI/FS) for a Superfund site in the San Francisco area to address remediation of a regional ground water plume covering approximately 200 acres. Elevated levels of volatile organic chemicals (VOCs) had resulted from the release of organic solvents from various manufacturing facilities. ENVIRON evaluated ground water flow patterns in the three aquifers and developed chemical distribution maps. Aquifer response to the wells was monitored for 30 hours. Based on this information and data from previous investigations, ENVIRON developed a hydrogeologic model of the study area.

  After evaluating all applicable regulations to develop ground water cleanup goals, ENVIRON evaluated potential extraction, treatment, and disposal technologies. The USGS model, MODFLOW, was used to numerically simulate ground water hydraulics. Six remedial alternatives for various ground water extraction scenarios were then evaluated according to CERCLA criteria,

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Remedial Design and Engineering (continued)

and a preferred alternative was recommended.

- ENVIRON developed the Remedial Design (RD) for the Whitmoyer site in USEPA Region III, one of the most complex Superfund sites in the eastern United States. The Whitmoyer facility was used from the 1950s through the mid-1980s to produce a variety of veterinary pharmaceuticals, including organoarsenicals. The cleanup of the site involves over a dozen former lagoons, approximately 500,000 cubic yards of contaminated soils, an on-site and off-site ground water plume, an underground vault containing drums of still bottom wastes, and over a dozen contaminated site structures and buildings. Our work on the site included the assessment of risks posed by the various components of the site, a comparison of the risks and effectiveness of different remedial alternatives for each component, and negotiations involving the state and USEPA Region III.

- ENVIRON assessed the relative risk of the discharge of treated ground waters to the Toms River in New Jersey or through an ocean outfall to the Atlantic Ocean. The original remedy proposed by EPA was to discharge treated ground water to the Atlantic Ocean. This remedy selection was based upon the finding by EPA that the risk was less for an ocean outfall discharge than it was for direct discharge to the Toms River. EPA's proposed remedy was presented to the public at a time when there was heightened interest in ocean disposal due to other waste disposal impacts on the beaches along the New Jersey coastline. EPA reevaluated the situation and revised its proposed remedy to suggest discharge of the treated ground water to the Toms River. ENVIRON's evaluation of the risk clearly indicated that discharge through the existing outfall posed the least risk. In addition, a comparison of the originally proposed and the revised remedy selections indicated that the revision appeared to be based on factors other than the mitigation of risk to human health and the environment.

- At an active chemical manufacturing facility, ENVIRON developed a site remediation plan and bid documents to address extensive soil, ground water, and building contamination by VOCs, TPHCs, and PCBs. Our extensive ground water modeling and aquifer characterization capabilities were instrumental in interpreting the complex geologic setting at the site, and in developing an acceptable remediation plan. The plan included a combination of french drains, well points for on-site containment, DNAPL collection, and air stripping. On-site soil remediation plans consisted of *in situ* treatment using vacuum gas extraction. The project also involved rehabilitating or replacing the facility's deteriorating on-site industrial and storm sewers.

- ENVIRON recently completed a source control soil remediation project at a waste oil reclamation facility located in southern Louisiana, and is presently implementing a DEQ-approved ground water remediation plan. The project involved developing plans and specifications for soil remediation and ground water collection, treatment, and disposal; contractor selection; and oversight of remedial contractor activities. The project included excavation, transportation, and off-site land treatment of approximately 11,600 cubic yards of soil, and the design

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Remedial Design and Engineering (continued)

and construction of a ground water extraction/treatment system. The treatment system included flow equalization, oil/water separation, air stripping, filtration, and granular activated carbon adsorption.

- ENVIRON handled ISRA/ECRA cleanup efforts for an industrial client at two of their facilities in northern New Jersey. A sampling plan was prepared and implemented at both facilities that included testing of surface and subsurface soil and ground water. Bidding documents and cleanup plans that were approved by NJDEPE were prepared for each site. We selected qualified remedial contractors to perform the on-site work. An ENVIRON engineer remained on-site to certify at completion that the work was performed according to the approved cleanup plan. Cleanup plans included: installing ground water recovery trenches; abandoning monitoring wells; excavating contaminated soil; and constructing diversion channels and berms, and regrading site contours to improve storm water control.

- ENVIRON managed a soil and drainline remediation project at natural gas compressor stations in Kentucky belonging to a large natural gas pipeline company. The air compressors historically used lubricating oils containing PCBs, which were later detected in the soil and drainage systems. The cleanup work for the six PCB-contaminated stations in Kentucky was completed within the stringent schedule established under a consent decree between the client and the Commonwealth of Kentucky. We prepared plans and specifications and oversaw the remediation. The project was completed well within budget and on schedule, despite delays caused by weather and field conditions. Specialized cleaning agents for removing PCB contamination were used effectively in the drainline cleaning operation. The cleaning solution was successfully recycled after treatment, minimizing the waste generated and resulting in considerable savings in off-site disposal costs.

- For a microelectronics manufacturer in Sunnyvale, California, ENVIRON prepared a Remedial Design to address the remediation of heavy metals found in plant effluents. We characterized wastes from and evaluated the effectiveness of an existing wastewater pretreatment system; reviewed plant production processes; and reviewed historical compliance records. The Remedial Design included ion exchange, pH control, filtration for nonmetal wastes, and sulfide precipitation. We also prepared recommendations for a detailed operation and maintenance manual and for improvements in laboratory analytical procedures.

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